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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,431	07/02/2003	Richard L. Mahle	TI-34900 (1962-05300)	6527
23494	7590	08/02/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			BREWSTER, WILLIAM M	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	
			2823	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/612,431

**Applicant(s)**

MAHLE ET AL.

**Examiner**

William M. Brewster

**Art Unit**

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 16-23 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-7 and 16-23 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi et al., US Patent No. 4,731,516.

Noguchi anticipates a method for treating an area of a semiconductor wafer surface to reduce surface irregularities and stress concentrations, comprising: in fig. 2, treating the area 13B with a laser 21, wherein the treated area is melted by a laser beam 22 and re-solidifies 24 into a more planar profile 13C, col. 1, line 6 - col. 2, line 24; limitations from claim 2, wherein the treated area is ablated by the laser beam, vaporizing at least a portion of the surface irregularities, col. 2, lines 25-36.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi as applied to claims 1, 2 above, and further in view of Sun et al., US Publication No. 2003/0151053 A1.

Noguchi does not specify using all the industry standard lasers, but Sun does.

Sun teaches:

limitations from claim 3, wherein the laser is a diode-pumped, charge-loaded laser (in a solid-state laser), p. 3, ¶ 47;

limitations from claim 5, wherein the laser is emits green laser light, p. 2, ¶ 27;

limitations from claim 6, the method of claim 4, wherein the laser emits infrared laser light, p. 5, ¶ 60;

limitations from claim 7, wherein the laser is selected from a set consisting of an Nd:YAG laser, a frequency-doubled Nd:YAG laser, an excimer laser, a helium-neon laser, and a carbon-dioxide laser: Nd:YAG, p. 2, ¶ 47.

For limitations from claim 4 wherein the laser is a soft-marking laser, any laser that affects the visible properties of the surface of the substrate is a marking laser.

'Soft' is inherently subjective or may be optimized.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Sun's process with Noguchi's invention would have been beneficial because it gives the practitioner flexibility in using available laser technologies.

Claims 16, 17, 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Dias, US Publication No. 2003/0104679 A1.

Noguchi teaches a method comprising: in fig. 2, treating at least a portion 13B, of a sheet on a semiconductor wafer surface 11, wherein the surface is melted 22 and resolidifies 24 into a more planar profile 13C, thereby reducing stress concentration on the surface, col. 1, line 66 - col. 2, line 24;

limitations from claim 17, the method of claim 16, in fig. 2, wherein the wafer surface is melted by a laser 21, col. 1, line 66 - col. 2, line 24;

limitations from claim 23, the method of claim 16, wherein the treated portion is on the backside of the wafer, col. 1, line 66 - col. 2, line 24.

Noguchi does not specify scribing or sawing, but Dias does. Dias teaches limitations from claim 16, a method comprising: in fig. 2 treating at least a portion of a scribe street on a semiconductor wafer surface, wherein the surface is melted and resolidifies into a more planar profile 124, thereby reducing stress concentrations on the surface; and in fig. 5, sawing through the treated portion, p. 3, ¶ 35;

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limitations from claim 17, wherein the wafer surface is melted by a laser, p. 2, ¶ 24;

limitations from claim 21, wherein treating the wafer surface immediately follows laser marking, fig. 2, after laser passes over 124, p. 2, ¶ 24;

limitations from claim 23, wherein the treated portion is on the backside of the wafer, fig. 4, p. 3, ¶ 35.

Dias gives motivation in p. 1, ¶ 5. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Dias's process with Noguchi's invention would have been beneficial because it allowed for multiple chip processing and then dicing so each die can form a packaged microelectronic device.

Claims 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Dias as applied to claims 16, 17, 21, 23 above, and further in view of Sun et al., US Publication No. 2003/0151053 A1.

Neither Noguchi nor Dias specifies using all the industry standard lasers, but Sun does. Sun teaches:

limitations from claim 3, wherein the laser is a diode-pumped, charge-loaded laser (in a solid-state laser), p. 3, ¶ 47;

limitations from claim 5, wherein the laser emits green laser light, p. 2, ¶ 27;

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limitations from claim 6. The method of claim 4, wherein the laser emits infrared laser light, p. 5, ¶ 60;

limitations from claims 7, 19 wherein the laser is selected from a set consisting of an Nd:YAG laser, a frequency-doubled Nd:YAG laser, an excimer laser, a helium-neon laser, and a carbon-dioxide laser: Nd:YAG, p. 2, ¶ 47.

For limitations from claim 18 wherein the laser is a soft-marking laser, any laser that affects the visible properties of the surface of the substrate is a marking laser. 'Soft' is inherently subjective or may be optimized.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Sun's process with Noguchi's and Dias's invention would have been beneficial because it gives the practitioner flexibility in using available laser technologies.

Claims 20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Dias as applied to claims 16, 17, 21, 23 above, and further in view of Voutsas et al., US Publication No. 2004/0140206 A1.

Neither Noguchi nor Dias does not specify treating the wafer immediately before marking, but Voutsas does. Voutsas teaches limitations from claim 20, wherein treating the wafer surface immediately precedes laser marking; limitations from claim 22, wherein the treated portion is on the active surface of the wafer by laser cutting the substrates from a silicon ingot on both sides, p. 3, ¶ 48. Voutsas gives motivation in p. 3, ¶ 48. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Voutsas's process with Noguchi's and Dias's invention would have been beneficial because a laser gives the practitioner the option of cutting the substrate in more than one configuration.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-7, 16-23 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*William M. Brewster*

27 July 2005

WB